

1 Mark Questions

(A) Answer the following questions :

Q. 1. In which type of muscle tissue can you see intercalated discs ? What is its significance ?

Ans. Cardiac muscles tissue has intercalated discs. Intercalated discs support synchronized contraction of cardiac tissue.

Q. 2. What are mucus secreting cells called ?

Ans. Mucus secreting cells are called goblet cells.

Q. 3. Why intestinal mucosa has microvilli ?

Ans. Intestinal mucosa has microvilli to increase the absorptive surface.

Q. 4. Which protein constitute bone matrix ?

Ans. Ossein is the protein which constitute bone matrix.

Q. 5. What other name is given to transitional epithelium ?

Ans. It is also called as urothelium.

Q. 6. What are gap junctions ?

Ans. Gap junctions are a type of cell junctions that facilitate the cells to communicate with each other by connecting the cytoplasm of adjoining cells for rapid transfer of ions, small or big molecules.

Q. 7. Name two proteins found in striated muscles.

Ans. (i) Actin, (ii) Myosin.

Q. 8. Name the type of epithelium that lines the buccal cavity.

Ans. Stratified squamous epithelium.

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- Q. 9. Why blood plasma is pale yellow in colour ?**
Ans. Blood plasma is pale yellow in colour due to the presence of bilirubin.
- Q. 10. What are myoblasts ?**
Ans. Muscles forming cells are myoblast.
- Q. 11. Name any one heterocrine gland.**
Ans. Pancreas.
- Q. 12. What causes fatigue of the muscle fibre ?**
Ans. Fatigue of muscles fibres is caused by the accumulation of lactic acid.
- Q. 13. What is a ligament ?**
Ans. A connective tissue that joins a bone to another bone.
- Q. 14. Name any two granulocytes.**
Ans. Eosinophils (Acidophils) and Basophils.
- Q. 15. What is the role of mast cells ?**
Ans. Mast cells secrete heparin, histamine and serotonin.
- Q. 16. Name the tissue which lacks intercellular material.**
Ans. Epithelial muscles and nervous tissues lack intercellular material.
- Q. 17. What is mucus membrane ?**
Ans. Mucus membrane is simple epithelium cells containing mucus secreting cells.
- Q. 18. What is neurology ?**
Ans. Science dealing with the nervous system and its disorders is called neurology.
- Q. 19. Name the tissue which connects muscles to a bone.**
Ans. Tendon.
- Q. 20. What are neuroglia cells ?** **AI**
Ans. Neuroglia cells are the cells which holds the neurons together.
- Q. 21. What do fibroblasts synthesize ?**
Ans. The fibroblast in areolar tissue synthesize collagen and elastin proteins.
- Q. 22. What are dendrites ?**
Ans. Short outgrowths from the body of a nerve cell which conducts impulses towards the cell body.
- Q. 23. Give one example each of exocrine, endocrine and heterocrine glands.**
Ans. (i) Exocrine – Salivary gland
- (ii) Endocrine – Thyroid
(iii) Heterocrine – Pancreas
- Q. 24. What is diapedesis ?** **AI**
Ans. Leakage of WBCs from capillaries is called diapedesis.
- Q. 25. Name the materials of which white and yellow fibres are formed.**
Ans. White fibres are formed by collagen and yellow fibres are formed by elastin.
- Q. 26. Why are muscle cells usually called muscles fibres ?**
Ans. Muscle cells are usually called muscle fibres because the muscle cells are thin and elongated into a thread like structure.
- Q. 27. Name any one bone and the part where exactly the blood cells are formed.**
Ans. Femur, red bone marrow.
- Q. 28. What are two main groups of epithelial tissues ?**
Ans. Two groups are simple and compound.
- Q. 29. Where are RBCs formed ?**
Ans. RBCs are formed in red bone marrow in adult.
- Q. 30. Functionally, differentiate tendon and ligament.**
Ans. Tendon joins a skeleton muscles to a bone and ligament joins a bone to another bone.
- Q. 31. Define thrombosis.**
Ans. Clot is formed inside an intact vessel. Such a clot is called thrombus and its formation is thrombosis.
- Q. 33. What do you understand by synapse ?**
Ans. The end to end position of the axon of neuron and the dendrites of another neuron is called the synapse.

OR

Junction gap between two neurons is called synapse.

Q. 34. What are myoepithelial cells ?

Ans. Branched cells of epithelial origin containing muscle proteins which are specialised for contraction of cells e.g., sweat gland cells.

Q. 35. What is single unit smooth muscles ?

Ans. The muscle fibres that join together and contract as separate units are called single unit smooth muscles.

Q. 36. Where does areolar tissues occur ?

Ans. Areolar tissues occurs beneath the epithelia of many hollow visceral organs, skin and on the walls of arteries and veins.

(B) Each of the following questions has four choices. Choose the correct option in each case :

Q. 1. Ends of long bones are covered with

- (A) Tendons
- (B) Ligaments
- (C) Cartilage
- (D) Epithelial tissue

Ans. Option (C) is correct.

Explanation: Cartilage is a non-porous, firm but flexible supportive tissue. the ends of long bones are covered with cartilage.

Q. 2. Nucleus and mitochondria are absent in :

- (A) nerve cells of mammals
- (B) connective tissue
- (C) mature mammalian erythrocytes
- (D) epithelial cells

Ans. Option (C) is correct.

Explanation: Mature mammalian erythrocytes do not contain nucleus and mitochondria any other membrane bound organelles.

Q. 3. Major constituent of bone is

- (A) Calcium chloride
- (B) Calcium carbonate
- (C) calcium phosphate
- (D) All

Ans. Option (C) is correct.

Explanation: The matrix of bone is very hard and non-pliable because of the presence of salt of calcium and phosphorus called as calcium phosphate.

Q. 4. Cells of germinal epithelium are :

- (A) Ciliated
- (B) Columnar ciliated
- (C) Simple squamous
- (D) Cuboidal

Ans. Option (D) is correct.

Explanation: The cells in the deepest (basal) layer are columnar or cuboidal with oval nuclei. It is called *germinative layer* or *stratum malpighi*.

Q. 5. Voluntary striated muscles are found in :

- (A) Urinary bladder

- (B) Hind limbs

- (C) Heart

- (D) Lungs

Ans. Option (B) is correct.

Explanation: Voluntary striated muscles are found in hind limb. Rest all have involuntary muscles.

Q. 6. Mast cells are found in

- (A) Muscular tissue
- (B) Epithelial tissue
- (C) Nervous tissue
- (D) Connective tissue proper

Ans. Option (D) is correct.

Explanation: Yellow Elastic Connective tissue is mainly made up of much thicker branched loose network of yellow fibres. It also contains mast cells.

Q. 7. Constrictions in the axon of nerve cells are called:

- (A) Dendrons
- (B) Cyton
- (C) Nodes of Schwann
- (D) Nodes of Ranvier

Ans. Option (D) is correct.

Explanation: The nodes of Ranvier are characterized by short specialized regions in the axon membrane constriction which is not covered by myelin sheath.

Q. 8. pH of human blood is :

- (A) 7.4
- (B) 6.0
- (C) 9.0
- (D) None of the above

Ans. Option (A) is correct.

Explanation: Human blood is usually slightly basic, with a normal pH range of about 7.35 to 7.45.

Q. 9. Almost all muscles of body are derived from :

- (A) Mesoderm
- (B) Ectoderm
- (C) Endoderm
- (D) All of the above

Ans. Option (A) is correct.

Explanation: Major groups of tissue i.e. Epithelial, Connective and Muscular tissue are derived from mesoderm of embryo.

Q. 10. Axons serve to :

- (A) take impulses away from cytons
- (B) bring impulses to cytons
- (C) bring impulses to brain
- (D) take impulses away from brain

Ans. Option (A) is correct.

Explanation: Axon is the long process of cyton. It do not possess Nissl's granule. Axon carries the impulses away from the cyton.

2 Marks Questions

Q. 1. Name two leucocytes which are phagocytic.

Ans. Monocytes and Neutrophils

Q. 2. What is histology? Who coined the term?

Ans. The study of tissues or microscopic anatomy of plants and animals is called histology. The term histology was coined by Meyer.

Q. 3. What are functions of epithelial tissues?

Ans. (i) It protects the underlying tissues from mechanical and chemical injuries, dehydration and infection.

(ii) It act as a selection barriers.

(iii) It also forms glands that secrete secretions such as mucus, gastric juice and intestinal juice.

(iv) Epithelium of uriniferous tubules, stomach and intestine is absorptive.

Q. 4. What are the functions of mast cells?

Ans. (i) Mast cells granules release heparin which prevents activation of prothrombin, thus preventing coagulation of blood in the blood vessels.

(ii) The granules store inflammation producing substances like histamine.

Q. 5. Name the tissue that lines the bronchioles. State any one advantage of this tissue being present there.

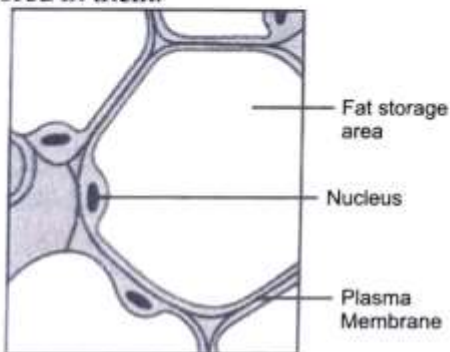
Ans. Ciliated epithelium lines the bronchioles.

Advantage : The ciliary movement maintains the flow of mucus or liquid or suspended bodies constantly in one direction.

3 Marks Questions

Q. 1. Where do you find adipose tissues in human body? Describe its structure only through diagram. Give its important function.

Ans. Adipose tissues are located beneath skin. Fats are stored in them.



Function: Adipose tissue help to store fats & lipids as reserve energy source and absorb mechanical shocks.

Q. 2. Name the tissues which perform the following functions :

- (i) Haemopoiesis,
- (ii) Formation of antibodies,
- (iii) Coagulation,
- (iv) Locomotion,
- (v) Transmission of message,
- (vi) Protection against mechanical shocks

Ans. (i) Bone marrow
(ii) Lymphocytes (Kind of W.B.Cs.)
(iii) Thrombocytes (Kind of blood cells)
(iv) Muscular tissue
(v) Nervous tissue

Q. 3. Differentiate between epithelial tissue and connective tissue.

Ans.

S.No.	Epithelial Tissue	Connective tissue
(i)	They are formed of same types of cells in a particular sub-type e.g., squamous, cuboidal or columnar.	They are different types of cells in a sub-type e.g., histocytes, mast cells, adipocytes.
(ii)	No intercellular space between the cells are present.	There are large intercellular spaces between the cell.
(iii)	Basement membrane is present.	Basement membrane is absent.
(iv)	Their functions are covering, protection, secretion and sensory.	They function as intercommunication of various tissues.

Q. 4. What are leucocytes? Mention their different kinds.

Ans. Leucocytes are known as white blood cells (WBC). They are oval/rounded or irregular in shape. WBCs have nuclei but are devoid of haemoglobin. They are of two kinds : (1) granulocytes, and (2) agranulocytes. Granulocytes possess granules of varying sizes and have lobed nuclei. They are of three kinds : (a) basophils, (b) acidophils, (c) neutrophils based on the staining feature. Monocytes and lymphocytes are two types of agranulocytes. They are non-granular and always have only one nuclei in individual cell.

Q. 5. Write the functions of blood plasma.

Ans. The functions of blood plasma are :

- (i) Transport.

(v) Prevention of blood loss.

(vi) Conducting heat to skin for dissipation.

(vii) Uniform distribution of heat all over the body.

Q. 6. Differentiate between the fibres of connective tissue.

Ans. Differences between the fibres of connective tissue :

S.No.	Nature	Collagen fibres	Elastic fibres	Reticular fibres
(i)	Colour	White	Yellow	White
(ii)	Protein	Formed of protein collagen	Elastin protein.	Protein, reticulin
(iii)	Occurrence	In bundles	Singly	Singly
(iv)	Nature	Unbranched	Branched and anastomosing	Branched and framework
(v)	Fibres	Thick, long and wavy	Thin, long and straight	Short
(vi)	Elasticity	Tough and non-elastic	Elastic	Delicate
(vii)	Location	Most abundant in tendons	Most abundant in ligaments	Most abundant in the embryo, in lymphoid blood forming tissues.

5 Marks Questions

Q. 1. Describe in detail (i) Loose connective tissue and (ii) Dense connective tissue.

Ans. (i) Loose connective tissue : In this, cells (fibroblasts, macrophages, mast cells, etc.) and fibres are loosely arranged in a semi-fluid, matrix. It has fewer fibres and more of matrix. It is of two types: Areolar tissue and Adipose tissue.

(a) **Areolar Tissue :** It is the most widely spread connective tissue in the body. The non-living intercellular matrix contains irregular shaped cells and two kinds of fibres.

Location : Areolar tissues are found inside organs, around blood vessels, muscles and nerve. It also occurs below sub-cutaneous tissue and structures like muscles and skin.

(b) **Adipose Tissue :** It is a type of connective tissue that is specialized to store fat called adipose cells. The fats are stored inside cells called adipocytes. Adipocytes are large cells with one or more globules of fat and peripheral cytoplasm with nucleus at one end.

Location : The tissue is found below the skin, around internal organs and inside yellow bone marrow.

(ii) **Dense connective tissues :** In this, fibres and fibroblasts are compactly packed. It has more of fibres and less amount of matrix. It is of two types :

(a) **Dense regular connective tissues :** They show regular pattern of fibres. Collagen fibres are present in rows between many parallel bundles of fibres. e.g., tendons and ligaments.

• **Tendon :** Tendon is a tough, non-fibrous, dense, white fibrous connective tissue. It has great strength but limited flexibility.

Function : It joins a skeletal muscle to a bone, thereby helping the bone to move on contraction and relaxation of the muscle.

• **Ligament :** Ligament is a dense yellow fibrous connective tissue. It has considerable strength

and high elasticity.

Function : Ligament binds a bone with another bone.

(a) **Dense irregular connective tissues :** They have irregular pattern of fibres. It has fibroblasts and many fibres (mostly collagen) that are oriented differently. This tissue is present in skin.

Q. 2. Describe the supportive connective tissue in detail.

Ans. Supportive connective tissues : It is a connective tissue in which matrix is rigid and the living cells occur in fluid filled spaces called lacunae.

(a) **Cartilage :**

(i) Cartilage is a non-porous, firm but flexible supportive tissue.

(ii) It has solid matrix which is composed of chondrin. Secreted by the chondrocytes. Chondrocytes lie in the matrix singly or in groups of two or four surrounded by fluid filled space called lacunae.

(iii) Cartilage is present in the tip of nose, outer ear, joints in the vertebral column, limbs and hands in adults.

(iv) It provides support and flexibility to various parts of the body.

(b) **Bones :**

(i) Bone is a strong, rigid and non-flexible tissue. Bone is the hardest tissue of the body.

(ii) It consists of solid matrix with fluid filled lacunae having osteocytes or bone cells.

(iii) Matrix is composed of collagenous protein complex called ossein and mineral matter like salts of calcium, phosphorus, and magnesium.

(iv) The hardness of bone is due to deposition of mineral matter (calcium salts and collagen fibres).

(v) The matrix in mammalian bone like in thigh bone is arranged in concentric rings or lamellae around nutrient filled haversian canals.

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- (vi) The osteocytes lie on the lamellae and give out branched processes which join with those of the adjoining cells.
- (vii) The soft connective tissue present in the bone cavity is known as bone marrow. Sheath of bone is called periosteum. A layer of osteoblasts or bone forming cells lie below it.

Location : Bones are found all around the body. It forms the supportive framework of the body.

- (c) **Fluid connective tissue :** It consists of cells and matrix without fibres. Plasma is the extra cellular fluid of matrix, the ground substance. Blood and Lymph are two types of fluid connective tissue.

Q. 3. Differentiate between striated, smooth and cardiac muscles.

Ans.

S.No.	Nature	Striated Muscles	Smooth Muscles	Cardiac Muscles
(i)	Occurrence	These are present in the limbs, tongue, pharynx, beginning of oesophagus.	These are present in wall of visceral organs and also in hair muscles.	They form myocardium of heart.
(ii)	Arrangement	These are arranged in bundles.	They act as sheets in visceral organs.	They form continuous network in the body.
(iii)	Shape	These are long cylindrical with blunt ends.	They are short, spindle shaped with pointed ends.	They are short cylindrical with flat ends.
(iv)	Number and position of nuclei	These are multinucleated. Nuclei are peripheral.	They are uninucleated. Nucleus is central.	They are uninucleated. Nucleus is central.
(v)	Dark and light bands	Presence of dark and light bands.	No bands are present.	Bands present in them.
(vi)	Branches	These are unbranched.	They are unbranched.	They are unbranched.
(vii)	Contraction power	Contract rapidly for short period as soon as get fatigued.	They contract slowly for long period and do not get fatigued.	They contract rapidly, rhythmically and never get fatigued.

Q. 4. Write any four important functions of each :

- (i) Epithelial tissue
(ii) Connective tissue
(iii) Muscular tissue.

Ans. (i) **Functions of Epithelial Tissue :**

- (a) These protect the underlying tissues from mechanical and chemical injuries, dehydration and infection.
- (b) It act as selective barriers.
- (c) Surface epithelia produce skeletal structures like scales, feathers, hair, nails, claws, horns, hoofs etc.
- (d) Ciliated epithelia moves mucus or other fluids in the ducts, they line.

(ii) **Functions of Connective Tissues :**

- (a) They primarily join one tissue to another in the organs.

- (b) Skeletal connective tissues like bone and cartilages, form a supporting framework for the body.

- (c) Adipose tissues acts as shock absorber around some organs, such as eye balls and kidneys.

- (d) Fluid connective tissue, like blood and lymph, carry materials from one part to another in the body.

(iii) **Functions of Muscular Tissues :**

- (a) They are involved in the movements of the body parts and locomotion of the organism.

- (b) They are responsible for the heart-beat, production of sound and peristalsis in tubular viscera.

- (c) They support the bones and other structure.

- (d) They play an important role in parturition (child birth).

Key Words

- **Spermatophores** : Spermatophore are bundles masses of spermatozoa in cockroaches, earthworm, etc.
- **Nymph** : The young ones of cockroach-like insects, which resemble the adults, but lack wings and reproductive organs are called nymph.
- **Ootheca** : A capsule formed around the fertilized eggs also called egg case.
- **Haemocoel** : It is the body cavity in cockroach in which the body organs lie freely in the blood.
- **Tegmina** : It refers to first pair of long, thick and leathery wings used for flight.

1 Mark Questions

- (A) Give One Word Answer:
- | | |
|---|---|
| Q. 1. The place where sclerites present in cockroach. | Ans. Ten. |
| Ans. Exoskeleton. | Q. 4. The parts of respiratory stem of cockroach. |
| Q. 2. The mouth part of cockroach is comparable to our tongue. | Ans. Spiracles, tracheae and tracheoles. |
| Ans. Hypopharynx. | Q. 5. The excretory organ of cockroach. |
| Q. 3. The number of segments are present in the abdomen of cockroach. | Ans. Malpighian tubules. |
| | Q. 6. The male and female reproductive organs in Cockroach. |
| | Ans. Testis and Ovaries. |

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(B) Each of the following questions has four choices. Choose the correct option in each case :

Q. 1. Cockroach has following pair of legs :

- (A) 3 (B) 2
(C) 4 (D) more than 4

Ans. Option (A) is correct.

Explanation: The body of cockroach is segmented and divisible into head, thorax and abdomen. The thorax of cockroach contains two pairs of wings and three pairs of legs for movement and locomotion.

Q. 2. Eggs of Cockroach are fertilized in the :

- (A) Spermatheca (B) Spermatophores
(C) Ovaries (D) Genital chamber

Ans. Option (D) is correct.

Explanation: Common oviduct or vagina opens into the genital chamber. Egg of cockroach fertilized here.

Q. 3. The double nerve cord in cockroach is present on the :

- (A) ventral side (B) dorsal side
(C) above the heart (D) along the side line

Ans. Option (A) is correct.

Explanation: Nervous system of cockroach consist of a series of fused segmentally arranged ganglia joined by paired longitudinal connectives on the ventral side. Double nerve cord arises from sub-oesophageal ganglion.

Q. 4. Type of circulatory system found in cockroach:

- (A) Open (B) Closed
(C) Lacunar (D) both (A) and (C)

Ans. Option (D) is correct.

Explanation: Blood vascular system is open lacunar type having poorly developed blood vessels. The haemolymph is the blood of cockroach composed of colourless plasma and haemocytes.

Q. 5. The name of the portion of alimentary canal which crushes the food :

- (A) Crop (B) Gizzard
(C) Oesophagus (D) Stomach

Ans. Option (B) is correct.

Explanation: Gizzard helps in grinding the food particles .

Q. 6. Function related to Malpighian tubules in cockroach is

- (A) locomotion
(B) reproduction
(C) osmoregulation
(D) excretion, osmoregulation and homeostasis

Ans. Option (D) is correct.

Explanation: Malpighian tubules of cockroach are unique excretory organs. They are attached to the alimentary canal between the midgut and hindgut. They help in excretion, osmoregulation and homeostasis .

Q. 7. The body cavity of cockroach is known is:

- (A) coelom (B) acoelom
(C) haemocoel (D) coelenteron

Ans. Option (C) is correct.

Explanation: Haemocoel is the body cavity in cockroach in which the body organs lie freely in the blood

Q. 8. *Periplaneta* belongs to:

- (A) Hemichordate (B) Arthropoda
(C) Annelida (D) Mollusca

Ans. Option (B) is correct.

Explanation: *Periplaneta americana* belongs to phylum-Arthropoda .The body of cockroach is segmented and divisible into head, thorax and abdomen

Q. 9. The two pairs of wings of cockroach arise one pair each from :

- (A) Prothorax and mesothorax
(B) Mesothorax and metathorax
(C) Prothorax and metathorax
(D) Mesothorax and first abdominal segment

Ans. Option (B) is correct.

Explanation: Thorax consists of three parts : prothorax, mesothorax and metathorax. Fore wings and hind wings are arise from mesothorax and metathorax.

Q. 10. The mouthparts of cockroach are of which type?

- (A) cutting (B) chewing
(C) sucking (D) Both (a) and (b)

Ans. Option (D) is correct.

Explanation: The biting and chewing type of mouth parts of cockroach consists of a labrum (upper lip), a pair of mandibles, a pair of maxillae and labium (lower lip).

(C) Answer the following questions :

Q. 1. How is male cockroach distinguished from female cockroach ?

Ans. By the presence of the anal styles.

Q. 2. Name the scientific name of cockroach.

Ans. *Periplaneta americana*.

Q. 3. Where are hepatic caeca found ?

Ans. Attached to the anterior end of midgut.

Q. 4. Where are the sperms stored temporarily in the body of a male cockroach ?

Ans. In the seminal vesicles.

2 Marks Questions

Q. 1. What are spiracles ? How are they distributed in Cockroach ?

Ans. Spiracles are breathing holes located along sides of insect or exterior opening of the trachea in insect. There are 10 pairs of spiracles, 2 pairs in thorax and 8 pairs in abdomen.

Q. 2. What is the role of crop and gizzard in the digestive system of cockroach ?

Ans. Crop : In the thorax, the oesophagus dilates into a large thin-walled pear-shaped sac known as crop, which extends far behind into the abdomen. The crop is the largest part of the foregut and it serves as a reservoir for food.

Gizzard : The Gizzard is surrounded by thick layers of circular muscles. Its internal wall gives out six hard chitinous teeth or pro ventricular plates which masticate the food.

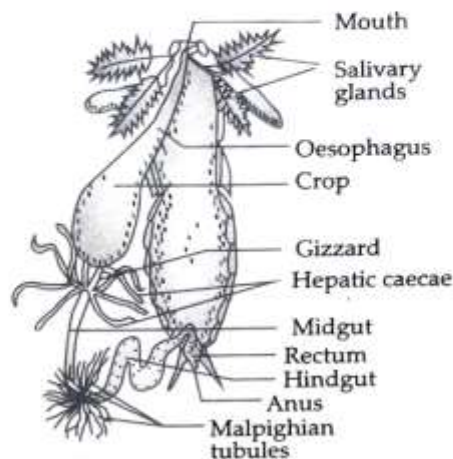
Q. 3. Write a note on Malpighian tubules of Cockroach.

AI

Ans. Malpighian tubules of cockroach are unique excretory organs. They are attached to the alimentary canal between the midgut and hindgut. They are thin-yellow coloured ectodermal threads that hang freely in the haemocoel and lined with a single layer of glandular epithelium cells having microvilli. They extract water and nitrogenous wastes from the haemocoel and convert them into uric acid and pass them into the ileum part of the hindgut.

Q. 4. Draw a labelled diagram of alimentary canal of a cockroach.

Ans.



Digestive System of Cockroach

Q. 5. How is the brood pouch formed in the female cockroach and name the parts present in it ?

Ans. Brood pouch in female cockroach is formed by the boat-shaped 7th sternum and the 8th and 9th sternae.

It contains a gonopore at its anterior end of the genital pouch spermathecal pores and collateral glands.

3 Marks Questions

Q. 1. Write a note on nervous system of cockroach.

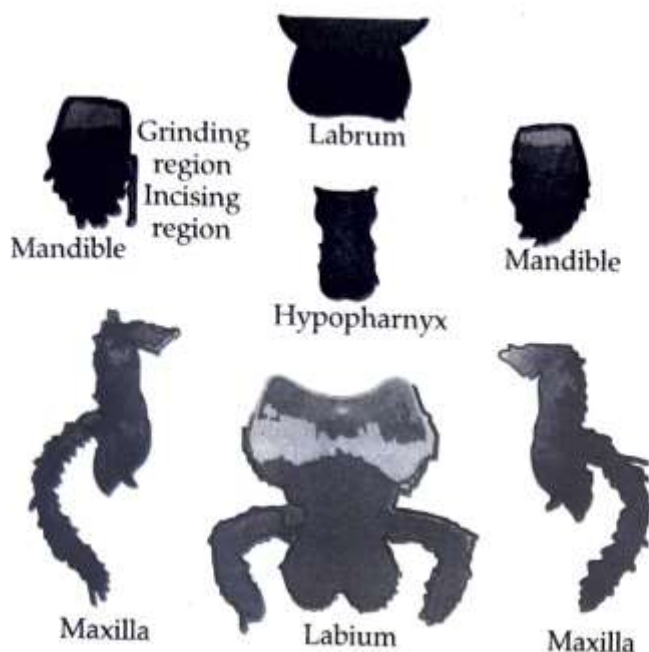
Ans. Nervous system of cockroach consist of a series of fused segmentally arranged ganglia joined by paired longitudinal connectives on the ventral side. Nervous system has central nervous system, peripheral nervous system and sympathetic nervous system. Central nervous system consists of supra - oesophageal ganglion in the head. It is formed by the fusion of three pairs of ganglia. Sub-oesophageal ganglion located in the head is formed by the fusion of three pairs of ganglia. Two circum-oesophageal connectives - short cord connects supra - oesophageal ganglion and sub - oesophageal ganglion. Double nerve cord arises

from sub-oesophageal ganglion. Nerve cord has three ganglia in the thorax and six abdominal ganglia.

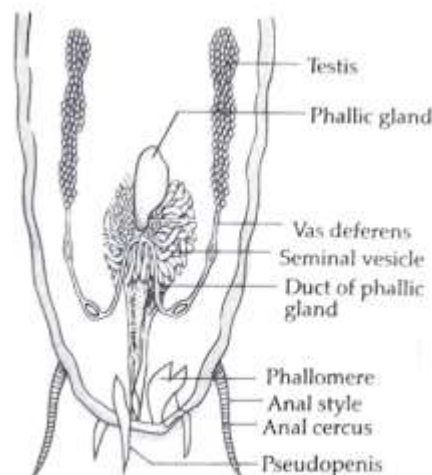
Q. 2. Describe the structures that constitute the mouth parts of a cockroach with diagram.

Ans. The mouth parts consist of the following :

- (i) a labrum (upper lip)
- (ii) a pair of mandible, each with two region - the grinding region and incising region.
- (iii) a pair of maxillae.
- (iv) a labium/lower lip and the hypopharynx within the cavity.



Ans.



Reproductive System Male Cockroach

Q. 3. Draw a well labelled diagram of male reproductive system of cockroach.

Q. 4. Mention a short note on eyes of cockroach.

Ans. Cockroach have a pair of sessile large compound eyes, which are located at dorso lateral side of head capsule. Eye is covered by transparent cuticle. Each eye has 2000 visual units called ommatidia. With the help of several ommatidia, a cockroach can receive several image of an object. This kind of vision is known as mosaic vision.

5 Marks Questions

Q.1. Write the differences between male and female cockroach.

AI

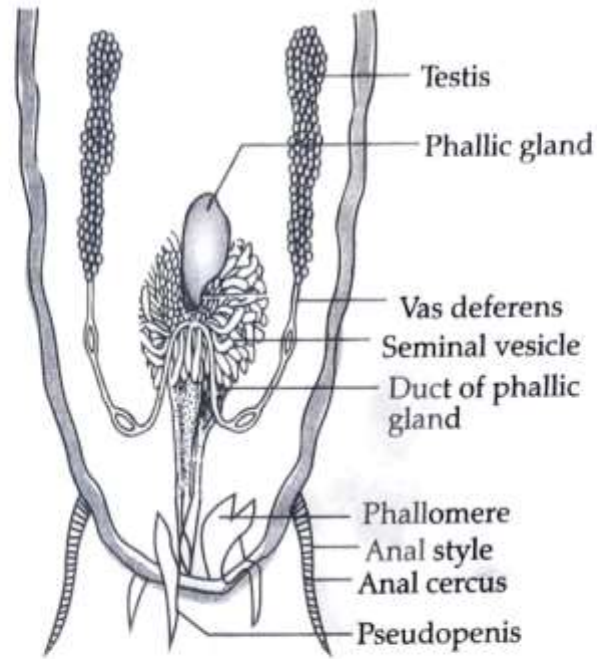
Ans. Differences between Male and Female cockroach are :

Male Cockroach	Female Cockroach
(i) The abdomen of a male cockroach is narrower.	The abdomen of a female cockroach is comparatively wider.
(ii) Ventrally 9 sterna are visible in males.	Only 7 sterna are visible in females.
(iii) 7 th , 8 th and 9 th sternum are clearly visible.	7 th sternum is a split structure forming a boat shaped structure.
(iv) There is a pair of anal styles arising from the 9 th sternum.	Anal styles are absent.
(v) It contains dorsal anus, ventral male genital pore and gonapophysis.	Its anterior part contains female gonopore, spermathecal pores and collateral glands.

Q. 2. Explain the female reproductive system of cockroach with well labelled diagram.

Ans. Female Reproductive system consists of the following parts :

- (i) **Ovaries** : There are two large ovaries, lying laterally in the 2nd - 6th abdominal segments. Each ovary is formed of a group of 8 ovaries tubules or ovarioles, containing a chain of ova.
- (ii) **Oviduct** : Oviducts of each ovary unite into a single median oviduct, also called vagina.
- (iii) **Genital chamber** : Common oviduct or vagina opens into the genital chamber. The latter part of it is called vestibulum. Vestibulum together with genital chamber is called genital pouch. It opens outside by genital pore.
- (iv) **Gonapophysis** : Six chitinous plates surrounding the genital pore are termed gonapophysis.
- (v) **Spermatheca** : A pair of spermathecae are present in the 6th segment that open into the genital chamber.



Reproductive System of Male Cockroach

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